

REMARKS

Claims 1-7, all the claims pending in the application, stand rejected. Applicants have canceled claims 1 and 2. Applicants have amended claim 3, and have added new claims 8-10.

Oath/Declaration

The Examiner finds the oath or declaration to be defective because it does not identify the present application by application number and filing date.

A declaration executed by the inventors was filed with the original application. Ordinarily, the declaration has an appropriate box checked, either identifying the application as (1) attached or (2) identifying it by serial number and filing date. It appears that the box "attached" was not properly checked. In order to remedy this deficiency, Applicants are submitting a new declaration which has been executed by the inventors and is entitled "Substitute Declaration." The application serial number (09/892,466) and filing date (June 28, 2001) appear in the appropriate space.

Claim Rejections - 35 U.S.C. § 112

Claims 3-7 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. This rejection is traversed.

The Examiner notes that as currently written, claims 3-7 lack antecedent basis in several instances. The Examiner has identified certain examples where antecedent basis is lacking. Further, additional difficulties with the description in the claims have been identified.

Applicants have amended claims 3-7 in a manner that would remove this basis for rejection.

Claim Objections

Claim 2 is objected to under 37 C.F.R. § 1.75(c) as being of improper dependent form. The claim appears to be a duplicate of claim 1, except for the words "have been". Claim 1 is also objected to because the grammar does not comply with conventional U.S. practice. Finally,

claim 3 is objected to because the word “disk-shaped” is spelled in a manner inconsistent with use throughout the specification.

All the foregoing objections are remedied by cancellation of claims 1 and 2 and the amendment to claim 3.

Claim Rejections - 35 U.S.C. § 102

Claims 1-4 and 7 are rejected under 35 U.S.C. § 102(e) as being anticipated by Bennett et al (6,168,682). At least with respect to claims 3, 4 and 7, this rejection is traversed. As to claims 1 and 2, the rejection is moot.

The Invention

As a preliminary matter, Applicants note that the present invention is an improvement over the subject matter disclosed in European Patent Application EP 0855703 to Amo et al, which is cited in a subsequently discussed rejection under 35 U.S.C. § 103. Amo et al discloses in Figs. 1 and 19 an apparatus and method for laminating disk shaped substrates using a sequence of steps (Fig. 19) and pressing apparatus (Figs. 8 and 10-12), where pressure is applied from the inside outwardly. Moreover, a multi-stage apparatus for implementing the process is disclosed in Fig. 13. Amo et al expresses some concern with the presence of air bubbles in the manufactured product (col. 18, lines 45-50 and col. 11, lines 25-35, and col. 9, lines 29-46), however, there is no teaching or suggestion of the use of high pressure environments to further reduce the problem with bubbles.

The present invention teaches a method in Fig. 1, step 4, where both disk-shaped substrates are placed within a high-pressure atmosphere. The structure for providing such atmosphere is illustrated in Fig. 9 and a combined pressing and high atmosphere environment is provided in Figs. 13a, 13b. Preferably, the pressure member 100 is employed in advance to press the upward disk-shaped substrate against the lower disk-shaped substrate. This will drive the air bubbles from between the laminates prior to the application of a highly pressurized atmosphere, as explained in paragraphs 0083-0086. Further, as explained at paragraph 0089, the press member is pressed against the disk-shaped substrates to enlarge the contact portion from the

central side to the outside so as to push air bubbles outwardly (radially). Since the pressure force which relies on the press member may not contribute to the reduction of air bubbles, it is desirable to have the pressure force less than pressure of the high pressure atmosphere. As explained at page 14, the pressure force may be applied at the same station or other stations of the turntable illustrated in Fig. 6.

Bennett et al

Bennett et al teaches a method of manufacturing optical recording media having a step of applying a pressure sensitive adhesive layer to the inner surface of a first member and adhering the inner surface of a second member to the exposed surface of the adhesive layer in the second step, as detailed at col. 9, line 34-col. 10, line 46. As disclosed, the application of the release liner to a first member is accomplished using a rubber roll, which has a sufficient mass (between 1 kg and 10 kg) and is sufficiently soft so that the application pressure when moving the roller across the surface of the release liner can be kept constant. The adhesive layer is applied at an angle, to facilitate expelling of air onto the contact area. A similar rolling procedure is applied to the joined first and second members as described at col. 11, lines 38-59.

At col. 11, line 60 - col. 16, line 25, the use of hydrostatic pressure, in order to avoid a problem with formation of bubbles at the interface between the first and/or second inner surface and the pressure sensitive adhesive layer, is disclosed. Specifically, at col. 13, lines 34-49, it is taught that the assembled disks are transferred to a hydrostatic pressure chamber where they are subject to uniform hydrostatic gas pressure, in particular air pressure of at least 2 bar and preferably 10-40 bar. The pressure may be applied at room temperature or other temperatures and may involve gases other than air.

However, Bennett is clearly distinguishable from the invention of claim 3 in view of the amended language that states that the force applied in pressurizing the upper disk-shaped substrate against the lower disk-shaped substrate by means of the pressing body is less than the pressure of the high pressure atmosphere. This feature is not taught in Bennett et al.

Further, new claims 8, 9 and 10 have been added which specifically state that the pressurizing step and exposing steps are conducted at a common one of a plurality of stations.

Further, it is stated that such station is present on a turntable arrangement. Finally, a goal of having the maximum dimension of each of the multiple of the air bubbles set to be less than 50 micron is stated.

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over Amo et al (EP 0855703) in view of Bennett et al (6,168,682). This rejection is traversed.

The teachings of Amo et al have already been described and, the Examiner admits that the reference fails to suggest exposing both disk-shaped substrates to a high pressure atmosphere after pressing the upper disk shape substrate against the lower disk shape substrate. The Examiner looks to Bennett for such teaching. The Examiner concludes that on the basis of the teachings in Bennett, it would be obvious to one of ordinary skill in the art to modify Amo et al to have a hydrostatic pressure chamber as suggested by Bennett et al. The Examiner notes that Amo et al suggests the pressing functions set forth in claims 5 and 6, based upon the use of the hemispheric pressing member 100 in Fig. 17 and as disclosed at col. 11, lines 9-35.

The added features that have been outlined above and are now in claim 3 distinguish the invention over this combination.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Patent Application No. 09/892,466

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

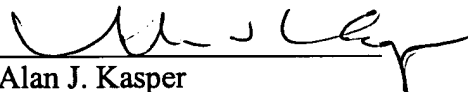
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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1 and 2 are canceled.

The claims are amended as follows:

3. (Amended) A method of laminating first and second disc-shaped substrates in order to form a disc product[characterized by] comprising the following [sequential four] steps[of];

1) bonding [the] an adhesive agent to [the] a surface of the [lower] first disc-shaped substrate,

2) placing the [upper] second disc-shaped substrate on the adhesive applied to [low] the first disc-shaped substrate,

3) [pressurizing] pressing the [upper] first disc-shaped substrate against the [lower] second disc-shaped substrate by means of [the] a pressing body by applying a first pressure level to join them and form a disc product, and

4) exposing both the disk-shaped substrates joined as a disc product to a high-pressure atmosphere at a second pressure level greater than said first pressure level.

4. (Amended) A method of laminating disc-shaped substrates according to claim 3 [characterized in that] further comprising:

pressing an adhesive sheet with the adhesive agent applied thereto [is pressed] against at least one of the first and second disc-shaped substrates from one end to the other end [in a step of], and

bonding the adhesive agent to the surface of the [lower] first disc-shaped substrate in such a manner that the adhesive-backed sheet is pressed against the substrate.

5. (Amended) A method of laminating disc-shaped substrates according to claim 3 [characterized in that] further comprising:

holding the pressing body [is so held] against the [upper] second disc-shaped substrate so as to magnify a contact portion from the center side to the outside in a step of pressing the [upper] second disc-shaped substrate against the [lower] first disc-shaped substrate by means of a pressing body in a state whereas the pressing body is held against said disc product in such a manner that a contact portion may be magnified from the center side to the outside.

6. (Amended) A method of laminating disc-shaped substrates according to claim 3 [characterized in that firstly] further comprising”

holding the pressing body [is held] against the [upper] second disc-shaped substrate in such a manner that a contact portion may be magnified from the center side to the outside, said holding step being conducted while said first and second [in a step of leaving both the] disc-shaped substrates are held within the high-pressure atmosphere.

7. (Amended) A method of laminating disc-shaped substrates according to claim 3
[characterized in that not only] further comprising:

applying a first hold down pressure in a step of bonding the adhesive agent to the surface
of the lower disc-shaped substrate, and

applying a second [but also another] hold down pressure in a step of pressurizing the
[upper] second disc-shaped substrate against the [lower] first disc-shaped substrate by means of
the pressing body [are employed], thereby magnifying pressure of the high-pressure atmosphere.

Claims 8-10 are added as new claims.